REMARKS

This communication is in response to the Office Action ("Office Action") mailed on September 4, 2002, in which Claims 1-19 were rejected. Claims 1-5, 7-9, and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of U.S. Patent No. 6,233,624 to Hyder et al. ("Hyder"). Claims 6, 10-11, and 13-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hyder in view of U.S. Patent No. 5,978,815 to Cabrera et al. ("Cabrera"). This document adds new Claims 20-23. Thus, the claims pending for reconsideration are Claims 1-23.

Prior to discussing the reasons why applicants believe that the claims as amended in this application are allowable, a brief discussion of the present invention, followed by a brief discussion of cited and applied references, is presented. The following discussion of applicants' invention and the cited and applied references is not provided to define the scope or interpretation of any of the claims in this application. Instead, these discussions are provided to help the United States Patent and Trademark Office ("the Office") better appreciate important claim distinctions discussed thereafter.

Summary of the Invention

The present invention addresses one of the shortcomings of supporting a kernel mode driver for providing management and diagnostic data in enterprise networks. One embodiment of the present invention provides an extension to a driver model to enable kernel component instrumentation. The present invention allows instrumentation data to pass between user and kernel mode so as to publish information, configure device settings and supply event notification from device drivers. To enhance the portability and usability of this data, the present invention communicates the data in a system and application independent ("SAI") manner. Accordingly,

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an SAI management system (such as a Web-based Enterprise Management Common Information System compliant management system) is then able to access device drivers, even if they are kernel mode drivers. This access is provided in the present invention via a set of common software routines that may be accessed by device drivers in support of the SAI management system. The common routines include typical routines that would ordinarily be executed by device drivers designed in accordance with an SAI management system. The common routines may reside in a driver library accessible by the device drivers. When a device driver receives a message from the management system, the device driver may pass the message to the library to be handled in a common manner. In this manner, the developers of device drivers in compliance with an SAI management system need only develop as much code as is necessary to support any unique features or data storage of their associated hardware. The result is a shortened development time and fewer programming errors. In addition, the overall system performance may be improved because fewer instances of similar code are loaded in memory to support the SAI management system. Also, the use of the library allows the underlying SAI routines to be modified without affecting the developer's driver so long as the interface to the library is maintained.

Summary of the Principal References Cited

The Hyder Reference

The Hyder reference provides a system for incorporating a link layer intermediate driver into a data flow path in a computer operating system. The data flow path is a path of execution that is traversed through a network protocol stack. The network protocol stack defines a data flow path through which data is passed between a transport layer and a physical device connected to a network. Generally, a network protocol stack comprises a transport layer driver,

one or more link layer intermediate drivers, and a link layer device driver interfacing with the physical hardware or device. The link layer intermediate driver receives data and returns processed data through an abstract interface while a link layer device driver is comprised of an interface with the abstract interface and a separate interface with the physical device. The abstract interface is comprised of a function library, which handles many of the details involved in managing synchronous and asynchronous communications across a network. The abstract interface also provides a library of functions for interfacing to the kernel mode of an operating system. Device drivers, therefore, need only perform hardware-specific operations needed to manage a particular piece of hardware or physical device. In contrast, traditional drivers incorporate most of the above functionality inherently, which makes such device drivers much harder to write and debug and often slower. Essentially, Hyder discloses providing a driver library separate from a device driver. However, Hyder does not disclose a management system, and in particular does not disclose an SAI management system.

The Cabrera Reference

The Cabrera reference, similarly to the Hyder reference, provides a model where a plurality of drivers or data managing routines cooperate to fulfill an input/output ("I/O") request. The drivers or data managers may have a layered relationship to each other such that each is responsible for processing a particular portion of an I/O request. Information may be passed from one layer to another using I/O request packets ("IRPs") so that all layers cooperate to fulfill an I/O request. Cabrera does not disclose a management system, and in particular does not disclose an SAI management system.

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The Claims Distinguished

Rejection of Claims 1-5, 7-9 and 12 Under 35 U.S.C. § 103(a)

Claim 1 has been amended to more clearly point out and distinctly claim the present invention. Accordingly, applicants submit that the 35 U.S.C. § 103(a) rejection of Claim 1 no longer applies. More specifically, as amended, Claim 1 reads as follows:

> A computer-readable medium having computer executable components, comprising:
> a device driver configured to provide information and perform actions associated with a hardware device; and
> a driver library containing software routines to make the information and actions provided by the device driver accessible to a system and application independent ("SAI") management system, the library being accessible by the device driver to handle messages issued to the device driver from the SAI management system.

Hyder does not teach, disclose or suggest a driver library containing software routines to make information and actions provided by the device driver accessible to an SAI management system. An SAI management system allows for the transfer of instrumentation information and actions to and from data providers and other management models for managing an enterprise network. There is no teaching in Hyder of providing or receiving instrumentation information to or from a management system. Additionally, Hyder fails to teach, disclose or suggest a "library being accessible by the device driver to handle messages issued to the device driver from the SAI management system."

Therefore, applicants assert that Claim 1 is clearly in condition for allowance. Since Claims 2-5, 7-9, and 12 all depend from Claim 1, Claims 2-5, 7-9, and 12 are submitted to be allowable for at least the reasons noted above.

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Claims 2-5, 7-9, and 12 contain additional recitations that further distinguish them from the teachings of Hyder, and they are submitted to be allowable for additional reasons. For example, Claim 7 recites "the unique software routine is configured to execute a method associated with the information associated with the device driver, the method being operative to pass additional information between the device driver and the SAI management system will perform a certain action." There is no teaching in Hyder of a unique software routine that is configured to execute a method associated with the information associated with the hardware device, let alone such a method being operative to pass additional information between the device driver and the SAI management system. Further, the Office Action has no other citation that either teaches, discloses or suggests such a unique software routine. Accordingly, Claim 7 and its dependent claim, Claim 8, are submitted to be allowable for this reason as well.

Rejection of Claims 6, 10-11, and 13-19 Under 35 U.S.C. § 103(a)

Independent Claim 13 has been amended to more clearly point out and distinctly claim the present invention. Accordingly, applicants submit that the 35 U.S.C. § 103 rejection of Claim 13 no longer applies. More specifically, as amended, Claim 13 reads as follows:

> A computer-readable medium having computer-executable instructions for providing management information to a SAI management system, which, when executed, comprise:
> receiving an input/output request packet ("IRP") message from the SAI management system, the IRP message including instructions regarding data maintained by an instrumented hardware device;
> passing the IRP to a driver library containing software routines for handling the instructions of the IRP message; and
> handling the IRP message by the driver library.

As already noted above with regard to Claim 1, Hyder does not teach, disclose, or suggest providing management information to an SAI management system and, with regard to Claim 13,

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neither does Cabrera. Consequently, with regard to Claim 13, neither reference teaches "receiving an input/output request packet ("IRP") message from the SAI management system." As neither Hyder nor Cabrera addresses providing management information to an SAI management system or for that matter any IRP message from an SAI management system, Claim 13 is submitted to be allowable.

Therefore, applicants assert that Claim 13 is clearly in condition for allowance. Since Claims 14-19 all depend from Claim 13, Claims 14-19 are submitted to be allowable for at least the reason noted above. Additionally, Claims 6 and 10-11 are submitted to be allowable as they depend from allowable Claim 1 noted above.

Since Claims 6, 10-11, and 14-19 include additional recitations that further distinguish them from the teachings of Hyder and Cabrera, they are submitted to be allowable for additional reasons. For example, Claim 11 recites "the driver library is further configured to receive, from the device driver, an identifier for a particular IRP, to execute a particular software routine related to handling the IRP and to **return to the SAI management system** any information received from the hardware device as a result of handling the IRP." Neither Hyder nor Cabrera teaches, discloses, or suggests returning to an **SAI** management system any information retrieved from a hardware device. Accordingly, Claim 11 is submitted to be allowable for this reason as well. Similarly, Claim 19 recites "the driver library is further configured to format data received from the device driver in a format consistent with the SAI management system." As neither Hyder nor Cabrera teaches, discloses, or suggests data formatted into a format consistent with an SAI management system, Claim 19 is submitted to be allowable for this reason as well.

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<u>Combination of Hyder and Cabrera</u>

In the Office Action it is asserted that Hyder teaches all the elements of Claims 6, 10-11, and 13-19 except IRPs. Applicants submit that the rejections of Claims 6, 10-11, and 13-19 are predicated on combining prior art references that contain no teaching or suggestion of how the cited references could be combined in any manner, much less the manner recited in the rejected claims. Simply put, the cited and applied prior art taken alone or in combination simply does not teach or suggest the subject matter of Claims 6, 10-11, and 13-19. The Office Action fails to point out any suggestion in the art for the desirability of the suggested modification absent the interpretation of the teachings of the applicants' disclosure. The rejection is using hindsight reasoning based on an inaccurate interpretation of the present disclosure to "produce" the claimed invention. The references do not teach or suggest how they could be combined in any manner, much less the manner recited in the rejected claims.

In summary, applicants submit that Claims 6, 10-11, and 13-19 are clearly allowable in view of the lack of teaching, disclosure, or suggestion for combination or modification in the cited and applied references taken alone or in combination. Even if the references were combinable in the manner discussed in the remarks accompanying the rejections of the claims, which applicants specifically deny, the resultant combination would not meet all the recitation of the claims, as noted above.

CONCLUSION

In view of the foregoing remarks, applicants submit that the present application is now in condition for allowance. Reconsideration and reexamination of this application, as amended, allowance of the rejected and new claims and passage of the application to issue at an early date are respectfully solicited. If the Examiner has any questions or comments concerning this

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application, the Examiner is invited to contact the applicants' undersigned attorney at the number below.

Respectfully submitted,

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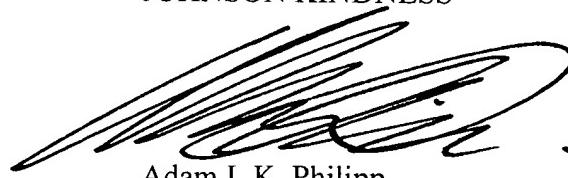
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Date: December 4, 2002

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1.   (Amended)   A computer-readable medium having computer executable components, comprising:

a device driver configured to provide information and perform actions associated with a hardware device; and

a driver library containing software routines to make the information and actions provided by the device driver accessible to a system and application independent ("SAI") management system, the library being accessible by the device driver to handle messages issued to the device driver from the SAI management system.

7.   (Amended)   The computer-readable medium of Claim 3, wherein the unique software routine is configured to execute a method associated with the information associated with the hardware device, the method being operative to pass additional information between the device driver and the SAI management system or perform a certain action.

8.   (Amended)   The computer-readable medium of Claim 7, wherein the driver library contains a software routine to format the additional information in a format consistent with the SAI management system.

11.   (Amended)   The computer-readable medium of Claim 1, wherein the driver library is further configured to receive, from the device driver, an identifier for a particular IRP, to execute a particular software routine related to handling the IRP, and to return to the SAI management system any information retrieved from the hardware device as a result of handling the IRP.

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13. (Amended) A computer-readable medium having computer-executable instructions for providing management information to a <u>system and application independent</u> <u>("SAI")</u> management system, which, when executed, comprise:

receiving an input/output request packet ("IRP") message from the <u>SAI</u> management system, the IRP message including instructions regarding data maintained by an instrumented hardware device;

passing the IRP to a driver library containing software routines for handling the instructions of the IRP message; and

handling the IRP message by the driver library.

19. (Amended) The computer-readable medium of Claim 18, wherein the driver library is further configured to format data received from the device driver in a format consistent with the <u>SAI</u> management system.

Claims 20-23 have been added.

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